Cancer Control Program

Reassessing Cancer Mortality in Rhode Island, an Old Urban State

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Objectives

The Rhode Island Department of Health (the Department) analyzed cancer mortality rates for residents of Rhode Island and the U.S. as a whole, 1950-1989, to observe trends and to identify causes of death which differentiate Rhode Island from the U.S.

Background

Previous research[1] had established that Rhode Island cancer mortality, among the highest in the U.S., displays an "urban profile."[2] In brief, Rhode Island, one of the most urban states, has higher than average cancer mortality. When this differential is decomposed, it is found to be caused by cancers of a very few sites, including cancers related to diet, such as cancers of the stomach and colon-rectum, cancers in which diet is implicated, such as cancers of the breast and prostate, and cancers related to tobacco use, such as cancers of the lung, urinary bladder, esophagus (also related to alcohol use), oral cavity, pharynx, and larynx. The mortality rates from such cancers are elevated in urban areas throughout the developed world.[2]

Methods

U.S. cancer mortality rates for 1950-1989 and Rhode Island cancer mortality rates for 1950-1979 were obtained from published statistics.[3,4] Rhode Island cancer mortality rates for 1980-1989 were derived from vital records and from U.S. Census data. All rates, published and derived, are directly standardized for age, using the 1970 population of the U.S. as the standard population, are specific for race, decade, and gender, and are expressed as "average annual deaths per 100,000 population per year."

Rates for African Americans were not available for the years 1950-1979. African American rates for individual cancer sites were not used because the Rhode Island rates, based on small numbers, are associated with large standard errors.

Results

The RI/US cancer mortality differential among whites has persisted from the 1950s through the 1980s, although it has diminished slightly (Table 1). The differential has been greater for males than females.

Table 1. Death rates, whites, Rhode Island and the U.S., by gender, cancer site, and decade

	Males			Females		
Cancer Site / Decade	**RI**	**US**	**RI/US**	**RI**	**US**	**RI/US**
All Cancers						

1950-1959	208.0	176.6	1.18	157.8	141.6	1.11
1960-1969	224.5	190.0	1.18	145.1	132.4	1.10
1970-1979	236.9	204.1	1.16	144.9	131.7	1.10
1980-1989	240.5	212.2	1.13	149.8	137.1	1.09
Lung and Bronchus						
1950-1959	34.6	29.6	1.17	4.4	5.1	0.86
1960-1969	53.5	46.8	1.14	7.4	7.6	0.97
1970-1979	71.7	64.0	1.12	15.2	15.3	0.99
1980-1989	76.3	71.9	1.06	26.7	26.0	1.03
All Except Lung and Bronchus						
1950-1959	173.4	147.0	1.18	153.4	136.5	1.12
1960-1969	171.0	143.2	1.19	137.7	124.8	1.10
1970-1979	165.2	140.1	1.18	129.7	116.4	1.11
1980-1989	164.2	140.3	1.17	123.1	111.1	1.11
Note: Rates are average annual, age-standardized, using the 1970 U.S. population as standard, expressed as deaths per 100,000 population.						

Mortality trends in both geographical areas were similar in the period of observation (Table 1). White male mortality from all cancers combined increased monotonically, but each ten-year increase was less than the last. White female mortality from all cancers combined decreased from the 1950s to the 1960s, remained about the same in the 1970s as the 1960s, then increased from the 1970s to the 1980s. Cancers of the lung/bronchus ("lung") drove the trends in all-cancer mortality. The increase decelerated among white males, who were already experiencing substantial mortality from cancers of the lung in the 1950s, and accelerated among white females, who were experiencing little mortality from cancers of the lung in the 1950s. From 1950 to 1989, the RI/US differential in mortality from cancers of the lung decreased among white males, but increased among white females. Mortality from cancers except lung decreased steadily from the 1950s through the 1980s among white males and females in both geographical areas. Decreases were more dramatic among females than males. The RI/US differential in mortality from cancers except lung remained relatively stable.

In the 1970s the RI/US cancer mortality differential for white males was caused by cancers of eight sites (Table 2), including two strongly related to diet (colon/rectum and stomach), one for which diet is implicated (prostate), and five strongly related to the use of tobacco (lung/bronchus, urinary bladder, esophagus, oral cavity and pharynx, and larynx). In the 1980s the RI/US mortality differential for white males was caused by cancers of ten sites, including the eight 1970s' sites, plus cancer of the brain and melanomas of the skin.

Differentials of no greater than 1/100,000 were observed for cancers of each other site in both decades.

Table 2. Death rates, selected cancers, white males, 1970-1979 and 1980-1989, Rhode Island and the U.S.

	1970-1979			1980-1989		
Cancer Site / Decade	**RI**	**US**	**RI/US**	**RI**	**US**	**RI/US**
Lung/bronchus	71.7	64.0	1.12	76.3	71.9	1.06
Colon/rectum	35.8	25.8	1.39	33.2	24.8	1.34
Prostate	21.7	20.3	1.07	22.9	21.9	1.05
Stomach	12.7	9.0	1.41	10.0	6.9	1.45
Urinary bladder	10.3	7.3	1.41	7.9	6.2	1.27
Brain/nervous system				6.4	5.2	1.23
Esophagus	6.2	4.4	1.41	6.2	4.8	1.29
Oral cavity/pharynx	8.0	5.6	1.43	5.6	4.6	1.22
Melanomas of skin				5.3	3.1	1.71
Larynx	3.9	2.7	1.44	4.0	2.4	1.67
All other	66.6	65.0	1.02	62.7	60.4	1.04

Note: Rates are average annual, age-standardized, using the 1970 U.S. population as standard, expressed as deaths per 100,000 population.

The RI/US cancer mortality differential for white females was caused by cancers of the same three sites in the 1970s and the 1980s (Table 3), including two strongly related to diet (colon/rectum and stomach), and one for which diet is implicated (breast). Differentials of no greater than 1/100,000 were observed for cancers of each other site in both decades.

Table 3. Death rates, selected cancers, white females, 1970-1979 and 1980-1989, Rhode Island and the U.S.

	1970-1979			1980-1989		
Cancer Site / Decade	**RI**	**US**	**RI/US**	**RI**	**US**	**RI/US**
Breast	31.4	27.0	1.16	31.1	27.2	1.14

Colon/rectum	26.6	19.8	1.34	20.8	17.2	1.21
Stomach	5.6	4.3	1.30	4.3	3.1	1.39
All other	81.3	80.6	1.01	93.6	89.6	1.04
Note: Rates are average annual, age-standardized, using the 1970 U.S. population as standard, expressed as deaths per 100,000 population.						

Among African Americans of both genders, mortality in the 1980s from all cancers combined was higher in Rhode Island than the U.S. (Table 4). In both areas, mortality was substantially higher among African Americans than whites, regardless of gender.

Table 4. Death rates, all cancers, 1980-1989, Rhode Island and the U.S., by race

	Males			Females		
Cancer Site / Decade	**RI**	**US**	**RI/US**	**RI**	**US**	**RI/US**
African Americans	333.1	306.3	1.09	202.2	161.2	1.25
Whites	240.5	212.2	1.13	149.8	137.1	1.09
Note: Rates are average annual, age-standardized, using the 1970 U.S. population as standard, expressed as deaths per 100,000 population.						

Discussion

Rhode Island continued to exhibit an urban cancer profile in the 1980s. Cancers related to tobacco use and diet predominated among those with higher mortality in Rhode Island than the U.S. as a whole. All differentials observed in the 1970s persisted into the 1980s. Small differentials for cancers of the brain/ nervous system and melanomas of the skin were observed for the first time in the 1980s, following well-documented increases in the incidence of both throughout the U.S. from 1970 to 1989.[5]

The RI/US cancer mortality differential diminished steadily in the 40 years of observation. Differences in lifestyle formerly associated with geography of residence are disappearing in the U.S. as a whole, with the urban lifestyle predominating.

The ravages of tobacco use are painfully evident in Rhode Island and the U.S. as a whole. Lung cancer was responsible for the increase in cancer mortality among whites between the 1950s and 1980s. Mortality from other cancers combined actually decreased in the same period, largely because of improvements in therapy. Cancers related to tobacco use were also responsible for much of the RI/US cancer mortality differential among white males in the 1970s and the 1980s. Although the prevalence of cigarette use among Rhode Islanders was not measured until 1973, it is believed to have exceeded 50% among males in the 1950s and 1960s, high even by urban standards.

Colorectal cancer was a substantial cause of mortality and contributed substantially to the RI/US cancer mortality differential throughout the 40 years of observation. A strong ecological correlation between colorectal cancer mortality and diet is observable throughout the world. Nations in which complex carbohydrates contribute a large majority of calories to the diet have very low colorectal cancer mortality; nations in which complex carbohydrates are supplanted by fats have high colorectal mortality. Even though clinical trials have not been performed to test the efficacy of low fat diets in the prevention of colorectal cancer, the ecological relation between diet and colorectal cancer is so strong that the American Cancer Society and the National Cancer Institute both recommend modifications in the American diet to reduce the proportion of calories from fat.[6]

Cancer prevention efforts must focus on tobacco use and diet. Recognizing this, the Department has selected high priority year 2000 health objectives[7] related to tobacco use (Table 5), and has estabished and run Rhode Island Project ASSIST, a local version of the American Stop Smoking Intervention Study developed by the National Cancer Institute. The Department has also selected high priority year 2000 health objectives[7] related to diet (Table 5), and has established a "Five a Day for Better Health" program, guided by the National Cancer Institute and the U.S. Centers for Disease Control and Prevention, which promotes increased dietary consumption of fruits and vegetables.

Table 5. High priority year 2000[7] health objectives selected by the Rhode Island Department of Health to guide its cancer control efforts, by risk factor
Tobacco Use
• Reduce cigarette smoking to a prevalence of no more than 15% among people aged 20 and older."
• Reduce initiation of smoking by children and youth so that no more than 15% have become regular cigarette smokers by age 20."
• Reduce smokeless tobacco use by males aged 12 to 24 to a prevalence of no more than 0.5%."
• Enact and enforce comprehensive laws on clean indoor air that prohibit or strictly limit smoking in the workplace and enclosed public places."
Environmental Tobacco Smoke
• Reduce by 50% the number of children exposed to environmental tobacco smoke in enclosed spaces."
• Increase to 50% the number of workplaces that are smoke free."
Diet
• Reduce dietary fat intake to 30% of calories or less and saturated fat intake to less than 10% of calories among 60% of people aged 2 and older."

• Increase complex carbohydrates and fiber-containing foods in the diets of 60% of adults to 5 or more servings of vegetables (including legumes) and fruits, and to 6 or more daily servings for grain products."
Women's Cancer Screening
• Increase to at least 90 percent the proportion of women aged 40 or older who have ever received a clinical breast examination and a mammogram, and to at least 80 percent those aged 50 or older who have received them within the preceding 1 to 2 years."
• Increase to at least 95 percent the proportion of women aged 18 and older with uterine cervix who have ever received a Pap test, and to at least 95 percent those who received a Pap test within the preceding 1 to 3 years."
Primary Health Care
• Increase to at least 95% the proportion of people who have a specific source of ongoing primary care for coordination of their preventive and episodic health care."
• "Improve financing and delivery of clinical preventive services so that virtually no Rhode Islander has a financial barrier to receiving, at a minimum, the screening, counseling, and immunization services recommended by the U.S. Preventive Services Task Force."

Other important cancer control efforts include screening for cancers of the breast and cervix, and assuring state-of-the-art therapy for the victims of all cancers.[8] The Department has selected high priority year 2000 health objectives[7] for women's cancer screening (Table 5), and is continuing its efforts to assure high rates of screening among women throughout the State, with a special focus on women of low income. State of the art cancer therapy begins with universal, high quality, primary health care, from which patients may develop an understanding of cancer prevention and receive appropriate cancer screening and referral, as necessary, for specialized cancer therapy. In this vein, the Department has selected high priority year 2000 health objectives[7] for primary health care (Table 5), and has played an important role in expanding primary health care services to people of low income through the RIte Care program.

It is time to revisit cancer control planning in Rhode Island. The plan which has served us well in the first half of this decade must be evaluated and modified in light of new surveillance information and developments in cancer control. Nonetheless, as the present analysis demonstrates, the major challenges haven't changed: tobacco use, diet, and access to screening and treatment. We must meet them with renewed purpose and vigor.

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